

Application No. 10/616,238
Amendment Dated November 22, 2004
In Reply to Office Action dated July 23, 2004

Remarks

Claims 1-10 are pending.

Claims 1-10 stand rejected.

Claims 1-10 have been amended.

Claims 1-10 are submitted herein for review.

No new matter has been added.

In paragraph 2 of the Office Action, the Examiner has objected to Figure 1 because it does not include the legend “Prior Art.” Applicants have amended Figure 1 accordingly, and respectfully request that this objection be withdrawn.

In paragraph 3 of the Office Action, the Examiner has objected to the figures because Figure 2 does not show vertical cavity 16. Applicants note that Figure 2 is a cross section along the lines A-A from Figure 3, as noted in the specification. Vertical cavity 16 is a vertical cavity disposed within the later wall 2, near partition 9 and extends for a length (vertically within the wall) roughly equal to the height of the partition 9 and the wall 2. This element of the vertical cavity 16 was shown in Figure 2 as filed. Applicants have amended Figure 2 accordingly to place the appropriate element number “16” to properly identify vertical cavity. Applicants respectfully request that the objections to the figures be withdrawn.

In paragraph 5 of the Office Action, the Examiner has objected to the abstract for containing overly formal language. Applicants have amended the abstract accordingly, and respectfully request that this objection be withdrawn.

In paragraph 7 of the Office Action, the Examiner has rejected claims 1-10 under 35

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U.S.C. § 103(a) as being unpatentable over either the applicant's admitted prior art or Munck et al. (U.S. Patent No. 5,576,489) in view of Bradley (U.S. Patent No. 1,999,684).

In the remarks, the Examiner has asserted that either the applicant's admitted prior art or Munck shows all of the features of the present invention except for a lateral wall with a vertical cavity at least partly in the wall. The Examiner continues by stating that Bradley shows such a vertical cavity and that it would have been obvious to one of ordinary skill in the art to combine the teachings of Bradley with either the applicant's admitted prior art or the Munck reference to alleviate vacuum pressure build up in the chamber, and to arrive at the present invention as claimed.

Applicants respectfully disagree with the Examiner's contentions, and submit the following remarks in response.

The present invention as claimed in independent claim 1, is directed to an oscillating piston volumetric fluid meter having a cylindrical measuring chamber. The fluid meter has a lateral wall, a bottom and a lid, a lower cylinder and an upper cylinder having the same diameter, which is less than the diameter of the chamber

An inlet orifice and an outlet orifice respectively admit fluid to and evacuate fluid from the chamber. A cylindrical piston is disposed eccentrically and guided kinematically in the chamber and effects an oscillatory movement in the chamber as a result of the displacement of a volume of fluid.

A fixed partition between the inlet orifice and the outlet orifice, lies radially between the lateral wall and the lower and upper cylinders, and lies axially between the bottom and the lid. The lateral wall including a vertical cavity in the vicinity of the fixed partition, such that the

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cavity is separate from the inlet and outlet orifices and passes through the lateral wall at least partly along the height of the wall.

This arrangement provides a distinct advantage over the cited prior art. Prior art arrangements suffer from drawbacks whereby suspended particles become immobilized between the exterior diameter of the piston and the interior diameter of the lateral wall. Some prior art arrangements address this by using a horizontal groove placed in the bottom of the chamber to collect solid particles. However, such a method is unsatisfactory because the small groove is insufficient to evacuate particles, particularly in heavily “charged” fluids. See background section of the specification page 3, paragraphs 2 and 3.

The present invention overcomes this drawback by including a vertical cavity in the lateral wall near the partition, configured such that the cavity is separate from the inlet and outlet orifices and *passes through* the lateral wall at least partly along the height of the wall. Here the meter prevents immobilization of solid particles between the exterior diameter of the piston and the interior diameter of the lateral wall, by allowing the particles to exit the chamber by passing through the lateral wall via the vertical cavity. Because the vertical cavity, along at least a portion of the height of the lateral wall, allows particles to pass through the lateral wall, a third outlet from the chamber, apart from the outlet or inlet orifices is provided. By placing the vertical cavity close to the partition, the cavity does not overly affect the metrology of the meter. See specification page 4, paragraph 7; page 7, paragraph 2; and Figs. 2 - 4.

As noted on page 5, lines 25-33, the present invention states:

“Thanks to the invention, particles are evacuated over at least a portion of

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the height of the chamber, thereby leading to a flowrate that is improved compared to evacuation via only a small section enlargement of the surface of the orifice. This cavity evacuates more effectively particles situated between the outside diameter of the piston and the inside diameter of the measuring chamber.”

The applicant’s admitted prior art, in Fig. 1 (prior art) shows a standard volumetric flow meter which suffers from the drawbacks of not being able to adequately remove particles from the chamber when metering “charged” liquids.

The cited prior art, namely Munck et al., is directed to a measuring device for measuring liquid with particles suspended therein. In Munck grooves 21 and 22 are positioned exclusively along the bottom edge of the chamber.

The cited prior art, namely Bradley, teaches an oscillating meter. The chamber has a partition 16 therein and has a vertical opening near the partition. This vertical opening (not given a specific element number) is entirely closed and does not pass through the lateral wall at any point. As this element number is not specifically identified, no particular function is given, but it can not allow particles to escape the chamber as it does not pass through the lateral wall at any point.

The Examiner admits that the Munck and applicant’s admitted prior art do not show a vertical cavity as claimed. Instead the Examiner relies on the Bradley reference. However, the Bradley reference, even when combined with the Munck or applicant’s admitted prior art, still does not show all of the elements of claim 1. For example, none of the cited references either alone or in combination with one another, teach or suggest a lateral wall including a vertical cavity in the vicinity of the fixed partition configured such that the cavity is separate from the

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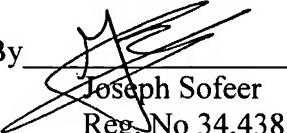
inlet and outlet orifices and *passes through the lateral wall* at least partly along the height of the wall. As noted above, the Bradley reference, relied on by the Examiner for this portion of the rejection, does not show a vertical cavity that passes through the lateral wall at any point.

As such, Applicants submit that the cited prior art references, either alone or in combination with one another, do not teach or suggest all of the elements of independent claim 1, and respectfully request that the rejection of this claim be withdrawn. Additionally, as claims 2 – 10 depend from independent claim 1, these claims should be allowed for the same reasons.

In view of the forgoing, Applicants respectfully submit that pending claims 1-10 are now in condition for allowance, the earliest possible notice of which is earnestly solicited. If the Examiner feels that an interview would facilitate the prosecution of this Application they are invited to contact the undersigned at the number listed below.

Respectfully submitted,

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Amendments to the Drawings:

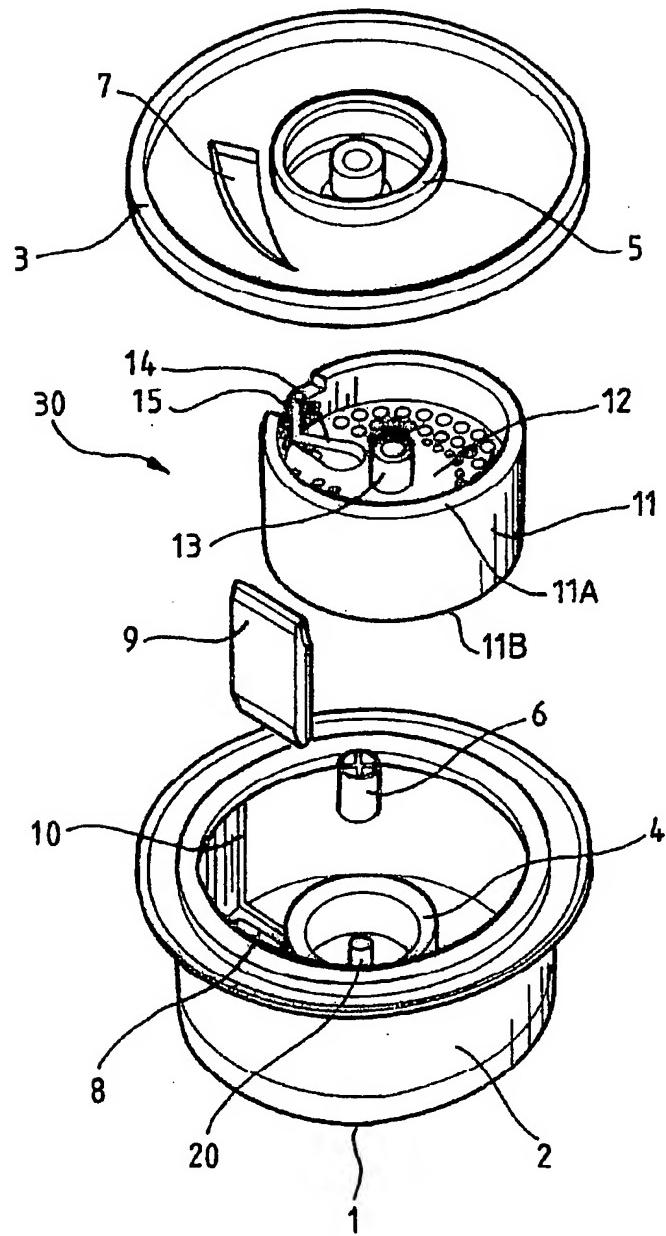
The attached sheets of drawings include changes to Figures 1 and 2. Sheet 1, which includes Figure 1, replaces the original sheet 1 including Figure 1. Sheet 2, which includes Figure 2, replaces the original sheet 2 including Figure 2. In Figure 1, the legend "Prior Art" has been added. In Figure 2, the element number "16" has been added.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

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Annotated Sheet Showing Changes

1/5

FIG-1



(PRIOR ART)



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FIG_2

